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INTRAVASCULAR ULTRASOUND ASSESSMENT OF MINIMAL STENT AREA AND INTIMAL HYPERPLASIA IN IN-STENT RESTENOSIS AFTER DRUG-ELUTING OR BARE-METAL STENT IMPLANTATION: THE NORDIC INTRAVASCULAR ULTRASOUND STUDY (NIVUS)

Poster Contributions
Poster Sessions, Expo North
Sunday, March 10, 2013, 9:45 a.m.-10:30 a.m.

Session Title: Intravascular Imaging: IVUS and OCT
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Background: Drug-eluting stents (DES) reduce the risk of restenosis after percutaneous coronary intervention (PCI) compared to bare-metal stents (BMS). The mechanism of restenosis may be biological, mechanical or technical. The pattern of DES restenosis has predominantly been described as focal. The aim of the study was to evaluate, by intravascular ultrasound (IVUS), the minimum stent area (MSA) and the extent and distribution of intima hyperplasia in patients presenting with an in-stent restenosis after DES or BMS implantation.

Methods: The "Nordic Intravascular Ultrasound Study - (NIVUS)" study was conducted in Nordic and Baltic countries as a prospective multicenter registry where IVUS was used in patients with in-stent restenosis between August 2007 and November 2009.

Results: 208 patients (DES n=120 (57.7%) and BMS n=88 (42.3%) had IVUS performed before treatment for an in-stent restenosis 411 days [interquartile range (IQR) 183-1117] after the index PCI (DES 608 days [IQR 243-1181] vs. BMS median 269 days [IQR 150-977], p=0.005). Stents implanted at the index procedure time were longer in the DES group compared to the BMS group 25.0±12.3 mm vs. 19.9±9.2 mm, p=0.001, whereas stent size was significantly lower in the DES group (3.1±0.5 mm vs. 3.3±0.4, p=0.005). The MSA was significantly lower in patients treated with a DES compared to BMS (4.7±1.8 mm2 vs. 6.3±2.1 mm2, p<0.001). The percentage of stents that did not have a MSA of at least 5.0 mm was higher in DES (59.2% vs. 37.7%, p=0.006) compared to BMS treated patients. The cross sectional area of intima hyperplasia at the MSA site was significantly lower in DES compared to BMS (0.7±1.2 mm2 vs. 2.7±2.2 mm2, p<0.001). Intimal hyperplasia was covering 55.4±33.3% of the stent length in the DES compared to 90.7±17.4% in the BMS group, p<0.001. Four stent fractures (3.3%) occurred in DES, and 5 stent fractures (5.7%) occurred in BMS, p=ns.

Conclusions: In patients with in-stent restenosis, stent under expansion (minimum stent area < 5.0 mm2), was more often seen in DES than BMS restenosis. Compared to BMS, DES more often had focal in-stent restenosis with less intimal hyperplasia at the MSA site.